INTERIOR FINISH AND DECORATION OF FLYING BOATS

BY

FREDERICK J. PIKE, INTERIOR DESIGNER & DECORATOR OF AIRCRAFT

Seats for flying boats when used in compartments can be designed with built in features, that is, fastened to bulkhead and eliminating the rear legs that the average aircraft chair has. This method not only stiffens the hull structure but also afford the minimum seat weight. Take for example in photograph Fig I, seating equipment in the Commodore, That I desined each double seat has only three front legs which are attached to the bellframes and the back is fastened to the bulkhead giving the strongest yet the lightest seat so far developed for two people weighing only 12 1/2 pounds with disappearing center arm rest.

These seats give several advantages. First: The elimination of flooring and carpet underneath each seat saving considerable weight in the entire hull especially in a large twenty two or thirty two passenger boat. Second: The ease of inspection, being able to remove laid in flooring between seats because they are not fastened directly to flooring as in most cases. Third: A boxed in seat with light dural aprons in front and hinged baggage doors on aisle side gives the occupants of that seat a place for bags and parcels out of sight. Fourth: The built in seat has a very strong and substantial appearance for the air traveler as well as its simple clean design.

The frame is constructed of flanged dural tubing affording a good rivet fastening for canvas webbing, corner gusset plates and cross braces. The arms and legs were of square dural tubing. The shape of the arms and the polished natural finish gave a good moderne note of design contrasted by the arm rests which were upholstered in black leather with silver welting. The aprons and baggage door also were

finished in a like manner. The lower part polished and the upper covered in black. The rest of the seat was finished in black lacquer. Head rests were attached to each seat and were of sponge rubber cemented to aluminum back and covered with the cushion material.

The most efficient cushions for flying boats are the pneumatic type. The cushion case being sewed with a 4 1/2" boxing with snap fastners on rear edge of boxing to admit the liners. Each cushion has two liners, one filled with individual rubber balloons and the other liner of down which lays uppermost next to the finished case. Cushions constructed in this manner give extreme comfort with minimum weight also making inspection and replacement very easy when necessary.

The one cell air cushion is very impractical because if punctured the entire amount of air contained is lost and the resiliency of the cushion is gone whereas in the other type half of the small 4" balloons could be deflated and yet there would be plenty left in case of an emergency to use as life preservers. The seat and back cushions are attached with straps and makes a fine life preserver because of the great buoyancy of 73 pounds gained by the 44 individual balloons per person.

Kapoc cushions of the same size weighs about ~~two~~ one and one half times more than those described and with a fabric cover, the kapoc soaks water too rapidly but with imitation leather the fault is greatly prolonged and for this reason they often are used in land ships. Kapoc packs down rapidly when in use and is not nearly as soft as rubber and air.

In connection with side walls in metal hulls arises the question of inspection for corrosion or refinishing of skin, Stringers + Bulkheads In other words having walls that are independent from the general structure and fastened with screws to a sub-wood frame work at reasonable intervals so as to make the removal comparatively easy. I have found through experiment that celotex makes a very good material for sidewalls 3/8 of an inch in thickness. The side toward the skin of the hull is protected with two coats of varnish that makes it waterproof and fairly stiff. The fabric desired for the interior is applied to the unvarnished side by means of rubber cement and wraps around over the edges. This type of sidewall works out very good especially for metal aircraft in and around salt water. Materials such as Balsam-Wool, Dry-Zero and many others could be used between the finished cover and the skin obtaining much better insulating qualities but the absorption and holding of water would be very serious in the question of corrosion. A tacked in side wall with stuffing between skin and finished fabric would be very impractical for servicING as it would have to be torn out for inspection and repainting and this method would incurr a great deal of un-necessary expense and in-convenience. This last method is a good way to trim land ships of both tube and monocoque construction where the question of water and rapid corrosion is not so predominent.

Paragraph on Sheet 3 1/2

Lighting Fixtures of an attractive design help to put the snap and interest in an interior. Most of the fixtures available for the modern aircraft today are spun out of thin metal and looks very cheap, lacking very much in quality. I have made up some very fine fixtures in cast aluminum mountings in combination with opalescent glass panels two of which are shown in Fig II. These fixtures have double wiring with 12 volt 24 candlepower bulbs. Due to battery lighting the design is infulunced (influenced) by the amount of illumination obtained from low voltage bulbs. At present I am working on some opalescent glass tube lighting

additional on side walls. Page-3½

Photograph Fig II give the idea of a complete compartment for eight people. Note the trim well proportioned seating and also the side walls just mentioned.

While on the subject of walls and proportions I would like to give a few dimensions necessary for an ideal compartment. The width across of 8 ~~½ feet~~ and a length of 6 1/2 feet between bulk heads for fixed seats and 7 1/2 or 8 feet length for adjustable seat. The center aisle sunken gives a head clearance of about 6 feet 3 inches. These are the ~~minimum~~ sizes to seat eight passengers comfortably. Taking in consideration the angle of backs, depth of seat and leg room between seats. Photograph Fig III show a view lengthwise in a compartment. The attachment of sidewalls can be seen. The ceiling decoration in this particular ship was a rough texture paint of lead and oil with parchment color glaze. Other ceilings were im complementary colored lacquer with the decorative scheme brought out with stripping on bulb angles and stringers. The ceiling decorated in this manner give access to control cables and wiring.

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which will produce an interesting and modern effect for ceiling use.

Color harmony of the interior in connection with the exterior is quite important. They should be pleasing together so that when a person is in the cabin the wing color will not be a discord with ~~any~~ the ~~of the external parts~~ interior scheme. Most planes are painted in strong colors so as to be easily identified on ground or seen in the air and with these bright combination, the complement coloring consisting of secondary and tertary values and be used for the interior trim. For instance a ship with international orange surfaces, all black fuselage with grey and white extra decoration in the form of rythemic stripping can successfully have the following for the interior. Sidewalls tete colored, leather, fabrikoid, mohair or repp in a plain texture. Ceiling or head lining can be the same as walls or if separated by considerable windows, could be covered with silver ground fabrikoid with jade green airbrush design of modern intersecting squares. Seat cushions in a damask of peacock blue, green and black corded in corail red. Rug of almond green. Trim around windows such as metal sills same value as rug. Interior hardware and light fixtures in natural brushed aluminum. For every possible outside scheme of color the interior can be worked out in its complementary colors and made very attractive and pleasing to look at.

------PAN AMERICAN WORLD AIRWAYS----------Part II------

In this instalment the Sikorsky S.38B is continued:-

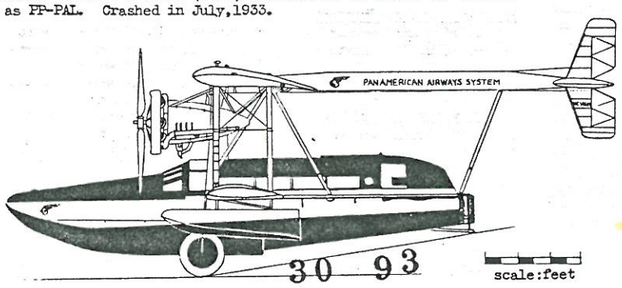
NC115M c/n 214-9. Originally with the NYRBA-Line and named "Porto Alegre". Taken over by Pan Am. on 15.9.30. This aircraft was stolen by Brazilian revolutionaries on 25.9.32, from a lake near Rio de Janeiro. It crashed 15 miles South of Rio de Janeiro, near Merity.

NC142M c/n 214-13. Delivered 16.9.29. Sold to Shell Aviation Corp. in 1936. It later became VH-UZE.

NC143M c/n 214-14. Bought from Liberty Amphibian Airships, Inc. after 1934. Subsequent fate not known.

NC144M c/n 214-15. Delivered 30.9.29. Also used by Panagra but there is no information on this plane after 1933.

NC145M c/n 214-16. Delivered 10.10.29. Used for a time by Uraba, Medellin & Central Airlines(UMCA)-a PAA subsidiary- and named "Marichu". Later (8.31) transferred to Panair do Brasil as PP-PAL. Crashed in July, 1933.



NC146M c/n 214-17. Delivered 16.10.29. Cancelled 29.3.43.

NC943M c/n 314-1. Originally with NYRBA-Line, but taken over by Pan Am. on 15.9.30. Used by UMCA in 1934, and sold to the Colombian Petroleum Co. in 1937-38.

NC944M c/n 314-2. Originally with NYRBA-Line, but taken over by Pan Am. on 15.9.30. Delivered to the P.A.A. affiliate New York Airways on 26.5.31. Crashed 14.6.32.

NC945M c/n 314-3. Delivered 16.1.30. Used by Panagra in 1931-33 and in 1935-36. Named "San Juan". Sold to Joseph P. Sheeha about 1938-39.

NC946M c/n 314-4. Originally with NYRBA-Line, but taken over by Pan Am. on 15.9.30. Scrapped August, 1933.

NC300N c/n 214-18. Delivered 22.10.29. Used by Panagra but transferred to SCADTA-Colombia. In use December, 1934.

NC301N c/n 214-19. Originally used by NYRBA-Line as P-BDAC "Bahia", but taken over by Pan Am. on 15.9.30. Transferred to SCADTA(Siciedad Colombo-Alemana de Transportes Aereos).

NC302N c/n 214-20. Originally used by NYRBA-Line, but taken over by Pan Am. on 15.9.30. Broken up December, 1930.

NC304N c/n 414-2. Delivered 12.11.29. Re-registered in August, 1931 as PP-PAK with Panair do Brasil. In use up to 1938.

NC306N c/n 414-4. Delivered 1929. Crashed in jungle, six miles from France Field, Canal Zone on 7.2.31.

NC308N c/n 414-6. Originally delivered to NYRBA-Line, but taken over by Pan. Am. on 15.9.30. Probably registered PP-PAB prior to transfer, and named "Porto Alegre". Became PP-PAB with Panair do Brasil subsequently. Scrapped 23.5.34.

NC309N c/n 414-7. Delivered 22.1.30. Crashed 4.31, while being used by SCADTA.

NC3V c/n 314-7. Delivered 1934 ex Sikorsky Aviation Corp., and used by SCADTA in Colombia.

NC16V c/n 314-20(known as S-38EH or ET). Delivered 8.5.33. Used by China National Aviation Corp.(CNAC). Crashed on Chusan Island, 24.11.33.

NC17V c/n 414-8(known as S-39EH or ET). Delivered 8.5.33. Dissappeared between Shanghai and Canton on 10.4.34.

NC18V c/n 414-9. Delivered 14.2.33. Transferred to Panagra on 3.33.

NC19V c/n 414-10. Delivered 14.2.33. Transferred to Panagra March, 1933. Sold in 1937 probably to Palm Beach Seaplane Service, Inc.

NC21V c/n 414-12. Bought by Pan American from John De Eldis Wack after 1934. Crashed 11.12.41 in Biscane Bay, Fla.

NC22V c/n 414-13(known as S-38ET). Delivered 19.1.33. Transferred to Panagra February, 1933.

NC40V c/n 514-4(known as S-38H). Delivered 31.3.33. Sold to Pan American affiliate Pacific American Airways Co., and shipped to China. Destroyed by a storm at Hankow on 13.8.35.

One unknown S-38 crashed at Havana, Cuba on 15.1.33.

SIKORSKY S-38B Specification:- Span(Upper wing)-71'8", (lower wing)-36'1 7/16", Wing Area, 720 sq. ft., Length 40'5", Height 15'6", Gross Wt. 10480 lb. Power:- 2 420 h.p. Pratt & Whitney Wasps or Hornets. Normal payload 2000 lb.
Performance:- Maximum speed 125 m.p.h., Cruising speed 110 m.p.h., Service Ceiling 18,000 ft., Cruising radius 600 miles. Passengers 10 to 12.

The next stage in the equipment of Pan American was the purchase of fourteen Consolidated 16 Commodores. Twelve of these were originally ordered by the NYRBA-Line, but the last few were not delivered until after the take-over on 15.9.30. Juan T. Trippe, President of Pan American, in a talk to the Royal Aeronautical Society in 1941, suggests that these aircraft were operated by P.A.A. from the start, but also states that they were introduced in 1929 and used on the trans-Caribbean and East coast routes of South America. The latter were operated by NYRBA until the take over in 1930.

Thanks to John Stroud, nearly complete details of these aircraft are available:-

NX855M c/n 1. Became P-BDAJ with the NYRBA-Line, and was named "Buenos Aires". With Panair do Brasil it was re-registered PP-PAJ. It returned to the U.S. register in 1935.

NC658M c/n 2. Became P-BDAA with the NYRBA-Line, and was named "Rio de Janeiro". Re-registered PP-PAA after the P.A.A. take-over and returned to the U.S. register in 1935.

NC659M c/n 3. Delivered November 1929, to the NYRBA-line and named "Havana". To Pan American on 15.9.30. Still in service in January, 1939.

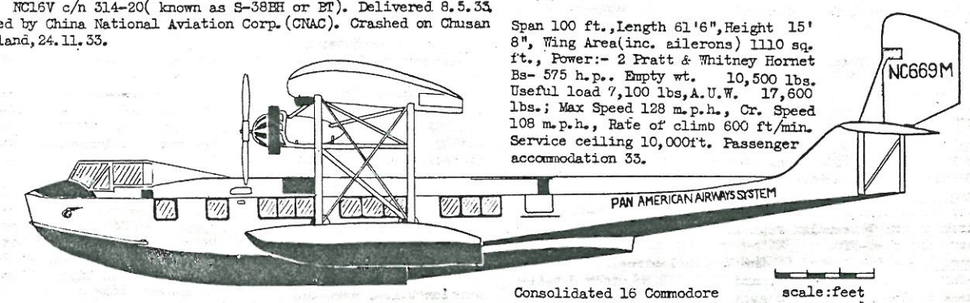
NC660M c/n 4. Delivered December, 1929, to the NYERA-line and named "Cuba". To Pan American on 15.9.30 and out of service about 1935.

NC661M c/n 5. Delivered to the NYRBA-line and named "Santos". It was re-registered P-BDAE for use in Brazil and became PP-PAE after take-over by Pan American and subsequent use by Panair do Brasil. NC661M returned to the U.S.A. in 1935.

NC662M c/n 6. Delivered to the NYRBA-Line, named "Sao Paulo" and re-registered P-BDAG for use in Brazil. It later became PP-PAG and was used by Panair do Brasil. NC662M returned to the U.S.A. in 1935.

NC663M c/n 7. Delivered March, 1930, probably to the NYRBA-line. Used by Pan American until 1937.

NC664M c/n 8. Probably delivered to the NYRBA-line, and then used by Pan American until 1937.



Span 100 ft., Length 61'6", Height 15'8", Wing Area(inc. ailerons) 1110 sq. ft., Power:- 2 Pratt & Whitney Hornet Bs- 575 h.p.. Empty wt. 10,500 lbs. Useful load 7,100 lbs, A.U.W. 17,600 lbs.; Max Speed 128 m.p.h., Cr. Speed 108 m.p.h., Rate of climb 600 ft/min. Service ceiling 10,000ft. Passenger accommodation 33.

Consolidated 16 Commodore scale:feet

THURMAN H. BANE
551 FIFTH AVENUE
NEW YORK

November 9, 1928.

Major R. H. Fleet,
Consolidated Aircraft Corporation,
2050 Elmwood Avenue,
Buffalo, N. Y.

My dear Fleet:

Just a word to thank you for the courtesies of yourself and Laddon in showing me all of your new developments on the occasion of my visit to Buffalo November 6th.

I enjoyed very much seeing your three new airplanes and see no reason why your development program should not put you in a very good position for the future. The ships are all excellent in appearance and structure and I trust the performance will be to your entire satisfaction.

I will be in Buffalo in about ten days and hope to see you again.

With very best wishes, I am

Sincerely yours,

Thurman H. Bane

THB:KA

CONSOLIDATED.

THE CONSOLIDATED AIRCRAFT CORPORATION.

HEAD OFFICE AND WORKS: 2,050, ELMWOOD AVENUE, BUFFALO, N.Y.

Incorporated: May, 1923.
President: R. H. Fleet.
Vice-Presidents: George Newman, Jr., Lawrence D. Bell, and Ray P. Whitman.
General Manager: Lawrence D. Bell.
Secretary and Treasurer: Thomas Kenny.
Chief Engineer, Unit No. 1: Joseph M. Gwinn, Jr.
Chief Engineer, Unit No. 2: I. M. Laddon.
Chief Engineer, Unit No. 3: Joseph M. Gwinn, Jr.
Chief Engineer, Unit No. 4: B. D. Thomas.

The Consolidated Aircraft Corpn. has specialised in the design and construction of training aircraft, and since its incorporation it has delivered nearly one thousand military training aeroplanes to the Army Air Corps and the Naval Air Service.

More than 300 Fleet commercial training aeroplanes (formerly named the "Husky Junior") were produced in 1929 and sold through Fleet Aircraft, Inc. (which see). The Army and the Navy each bought one Fleet biplane for experimental purposes.

By the end of 1929 the Company had delivered four "Commodores" to the New York, Rio and Buenos Aires Lines, Inc., and these were put into use on the Miami-Buenos Aires service of the Nyrba. By November 1, 1930, the Company will have completed its contract for the delivery of fourteen "Commodores" to Pan-American Airways, which company has now absorbed the Nyrba organisation.

The latest product of the Company is the "Fleetster" single-engined high-speed transport monoplane. This type is fully described on pages 255c-256c.

Late in 1929, the Consolidated Aircraft Corpn. bought the Thomas Morse Aircraft Corpn., of Ithaca, N.Y. This latter company has now been moved to Buffalo, where it now functions as a separate unit, although it is wholly owned by the Consolidated Aircraft Corpn. The Thomas Morse Corpn., since its purchase, has been engaged in the production of approximately 180 all-metal observation aeroplanes of the O-19B and O-19C types for the Army Air Corps.

THE CONSOLIDATED "COMMODORE."

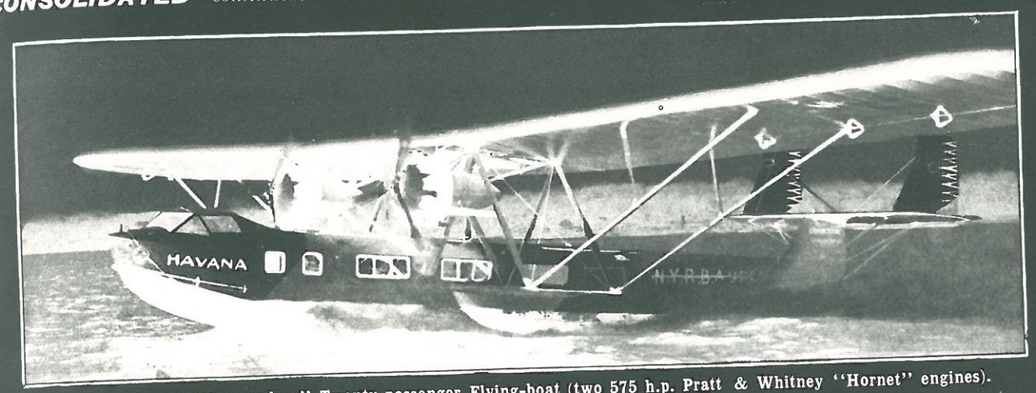
The "Commodore" is a commercial adaptation of the Consolidated PY-1 naval patrol flying-boat, which was described in this volume last year. It differs from that type with regard to the provision of accommodation for 20 passengers and the fitting of two 575 h.p. Pratt & Whitney "Hornet" engines in place of the two 425 h.p. "Wasp" engines of the same make.

TYPE.—Twenty-passenger commercial flying-boat.

WINGS.—Externally-braced monoplane. Aerofoil section Göttingen 398. Centre-section carried high above hull. Wing-bracing structure carries two outboard floats, each 14 ft. from hull, and also carries the two engines. Spars are built up Warren trusses with extruded aluminium alloy flanges and webs. Drag members are also built up in same manner as spars. Double system of wires used for drag-bracing. Ribs weigh about 2 lbs. each and are made of rolled flanged channels in Warren-truss form. Wing bracing is unusual in that streamline aluminium alloy tube is used.

HULL.—Single-step type. The lines are developed from those of the NC flying-boats. The waterlines converge from the step to the sternpost. From this post aft the hull is continued above the waterline to carry the tail structure. Aluminium alloy sheet and extruded bulb angles are used to make the bulkheads. Longitudinals of similar angles are spaced 7 in. apart for the deck and sides, with a closer pitch along the bottom. Two keels on plate girders and central keel truss. The whole sheeted with duralumin

CONSOLIDATED—*continued.*



The Consolidated "Commodore" Twenty-passenger Flying-boat (two 575 h.p. Pratt & Whitney "Hornet" engines).

16 gauge sheet is used on bottom forward of step (frame 14) to frame 5; frame 5 to frame 3, 18 gauge; frame 3 to nose, 20 gauge. 22 gauge is used for the rest of the hull. The floats have no step, but the lines appear to be orthodox. Construction similar to hull.

TAIL UNIT.—Monoplane tail carried on fin, extending up from centre line of hull. Two vertical fins and rudders. Construction similar to that used for wings. Single unbalanced elevator and balanced rudders.

POWER PLANT.—Two 575 h.p. Pratt & Whitney "Hornet" radial air-cooled engines, in nacelles, mounted beneath the centre-section and carried by the main bracing-struts. Fuel carried in the hull and pumped thence to gravity tanks in the leading-edge of the wing.

ACCOMMODATION.—In the nose of hull is the pilot's compartment, which seats two side-by-side, with dual controls. The control column is central and has a swing-over top, which allows single wheel to be brought in front of either seat. Aft of this compartment and forward of main step of hull, are three passenger compartments. The two forward compartments accommodate eight passengers, each in double seats, facing each other on both sides of a central aisle. The third compartment has two seats and two settees, one on either side of the central gangway. Aft of this compartment is the main companion-way, on each side of which is a mail compartment. The total capacity of the two compartments is 125 cub. ft. Sliding hatch covers are provided in the sides of the hull to facilitate the loading of mail. Forward of the front compartment is a division in the hull, the port side of which is devoted to a lavatory and a wireless room and the starboard side to an additional mail or baggage compartment of 75 cub. ft. capacity. This division is separated from the pilot's cockpit by a watertight door which may be opened from either side. All windows are permanently closed but ventilation is provided by controlable scoops.

DIMENSIONS.—Span 100 ft. (30.5 m.), Length 61 ft. 6 in. (18.75 m.), Height 15 ft. 8 in. (4.75 m.), Wing area 1,110 sq. ft. (103.16 sq. m.).

WEIGHTS AND LOADINGS.—Weight empty 10,500 lbs. (4,767 kg.), Pay load 5,350 lbs. (2,429 kg.), Disposable load 7,100 lbs. (3,223 kg.), Weight loaded 17,600 lbs. (7,990 kg.), Wing loading 15.8 lbs./sq. ft. (77.1 kg./sq. m.), Power loading 15.3 lbs./h.p. (6.94 kg./h.p.).

PERFORMANCE.—Maximum speed 128 m.p.h. (204.8 km.h.), Cruising speed 108 m.p.h. (172.8 km.h.), Landing speed 55 m.p.h. (88 km.h.), Initial rate of climb 600 ft./min. (183 m./min.), Service ceiling 10,000 ft. (3,050 m.), Cruising range 1,000 miles (1,600 km.).

A more recent version of the "Commodore," five of which have been delivered to the New York, Rio and Buenos Aires Line, or Nyrba, has accommodation for a crew of three and thirty passengers. The span of this enlarged type is the same as for the smaller type but the length has been increased to 68 ft. (20.74m.).

In this machine there are four passenger compartments, one holding six and three accommodating eight each. Further aft are a buffet, wireless room and lavatory with space for mail and express behind.

REUBEN FLEET DRAWER
1929 NYRBA COMMODORE — DOCUMENTS FOLDER

BRAZILIAN CIVIL AIRCRAFT REGISTER - MARCH 1938

Source: Boletim, Departamento de Aeronautica Civil, Ano 1 - N.1, Janeiro a Marco 1938, pages 140-143 inc. With supplementary information from April-June and July-September issues.

REGISTRATION	AIRCRAFT TYPE	C/N	OWNER
PP-FAB	R.W.D. 13	222	Departamento de Aeronautica Civil
PP-VAF	Junkers F-13	2064	S.A. Empreza de Viacao Aerea Rio Grandense
PP-VAG	Junkers F-13	2067	" "
PP-VAI	Junkers Junior A-50	3518	" "
PP-VAK	B.F.W. M-20-B	546	" "
PP-CAB	Junkers G-24	944	Syndicato Condor Limitada
PP-CAF	Junkers F-13	750	" "
PP-CAN	Junkers W-34	2593	" "
PP-CAK	Junkers F-13	745	" "
PP-CAO	Junkers W-34	2594	" "
PP-CAP	Junkers W-34	2595	" "
PP-CAR	Junkers W-34	2711	" "
PP-CAT	Junkers Ju 52/3m	4024	" "
PP-CAV	Junkers Ju 52/3m	4038	" "
PP-CAW	Junkers W-34	2791	" "
PP-CAX	Junkers Ju 52/3m	4093	" "
PP-CAY	Junkers Ju 52/3m	4042	" "
PP-CBB	Junkers Ju 52/3m	4078	" "
PP-CBC	Junkers Ju 52/3m	5453	" "
PP-CBD	Junkers Ju 52/3m	5478	" "
PP-PAA	Consolidated Commodore	2	Panair do Brasil, S.A.
PP-PAE	Consolidated Commodore	5	"
PP-PAG	Consolidated Commodore	6	"
PP-PAI	Consolidated Commodore	10	"
PP-PAJ	Consolidated Commodore	1	"
PP-PAK	Sikorsky S-38B	414-2	"
PP-PAM	Sikorsky S-38B	214-2	"
PP-PAP	Fairchild XA-942-A	9402	"
PP-PAS	Lockheed Electra	1008	"
PP-PAT	Fairchild XA-942-A	9403	"
PP-PAU	Sikorsky S-43	4308	"
PP-PAW	Sikorsky S-43	3404	"
PP-IAC	Stinson Reliant	8772	Aerolloyd Iguassu, S.A.
PP-IAD	Stinson Reliant SR-5E	9295A	"
PP-IAE	Stinson Reliant SR-5E	9334A	"
PP-SPA	Monospar Gal 4	ST-4-24	Viacao Aerea Sao Paulo, S.A.
PP-SPB	Monospar Gal 4	ST-4-25	" "
PP-SPC	D. H. 84 Mark 2	6085	" "
PP-SPD	Junkers Ju 52/3m	5459	" "
PP-SPE	Junkers Ju 52/3m	5465	" "
PP-SPF	Junkers Ju 52/3m	5689	" "
PP-ABA	Fairchild 24 C8-CS	2728	Aerobrasil Limitada
PP-ABB	Arrow F	82	Aerobrasil Limitada